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Water Heating in Multifamily

**California Building Energy Efficiency Standards
Revisions for July 2003 Adoption**

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Water Heating in Multifamily Residential

Description

The current water heating requirements carry with them some assumptions that create larger budgets than can be reasonably justified for multifamily (MF) water heating. One such assumption is that each dwelling unit will have the equivalent of one fifty-gallon water heater. This assumption is inappropriate for MF buildings where even first-cost accounting generally dictates a central water heating system. The standards need to recognize more discrete definitions of water heating system types, water heating system (like re-circulating distribution systems with sophisticated controls), and options that more specifically reflect current design parameters (boiler efficiency, storage tanks, piping losses, pump efficiency and hours of operation). Baseline budgets should vary depending upon a discrete set of design choices instead of the current one-size-fits-all water heating budget approach.

Benefits

Revising the water heating budgets for multifamily will save energy (both kWh and therms) and will also reduce peak demand. Making a simple choice (for other than energy efficiency reasons) to use a central boiler in a MF building provides enough *apparent* savings to allow developers to trade away numerous prescriptive efficiency features in the envelope and HVAC systems. Using a more realistic DHW budget will therefore save energy and reduce peak demand by preserving the prescriptive minimum levels.

Environmental Impact

We know of no negative environmental impacts associated with this measure.

Type of Change

Water heating revisions would affect the prescriptive requirements, and the performance method (ACMs). Some mandatory measures may also be drafted. The primary change would be development of new “custom” DHW budgets based on the DHW system type.

Measure Availability and Cost

No issues are associated with availability and cost. All measures that would be affected (water heating, envelope and HVAC) are already common construction practice in various building configurations.

Useful Life, Persistence and Maintenance

The useful life and persistence of these proposed changes to the code regarding water heating are high. The maintenance impacts are expected to all be positive for the building owners and the tenants.

Performance Verification

Performance verification may be necessary in some instances. For example, if the credits for distribution are expanded or refined, some special inspections may be necessary.

Cost Effectiveness

The cost effectiveness of refining water heating requirements for this occupancy type will likely be quite high. Cost-effectiveness calculations will be coordinated with the hourly DHW model currently under revision within other 2004 Standards projects. IOU residential efficiency programs have demonstrated the cost-effectiveness of this proposed change.

Analysis Tools

Water heating revisions will need to be addressed in the ACM. The water heating budget calculations and algorithms will be undergoing revisions anyway due to TDV work for water heating. The effort recommended in this proposal will have to be coordinated with that project.

Relationship to Other Measures

This measure has significant interactions with other the water heating measures and must be carefully coordinated. It also has significant interactions with other MF code efforts, virtually all of which the proposers of this project are also involved.

Bibliography and Other Research

1. TDV studies completed by PG&E and Water Heating TDV studies currently underway. (Research is being coordinated by HMG)
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7. High-Rise Multifamily Efficiency Upgrades: Measure Analysis. Pacific Gas and Electric. September 2001. (Prepared by the Hescong Mahone Group)
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